BRIEFING NOTE

The Review of Electricity Market Arrangements (REMA)

Insights for local authorities on the government's ongoing programme of wholesale electricity market reform.

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Created for Innovate UK Net Zero Living programme by Regen

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As part of the Innovate UK Net Zero Living Thriving Places programme, it is supporting 52 local authorities across the UK on the non-technical barriers to delivering local net zero.

Regen has joined the programme to provide support for local authorities in navigating and responding to policy and regulations that impact their ability to deliver their net zero ambitions. Innovate UK does not endorse any of the views or policy proposals set out in this briefing.

Authors:

Ellie Brundrett, Markets Lead, Regen
ebrundrett@regen.co.uk

Mollie Atherton, Local authorities lead, Regen
matherton@regen.co.uk

Poppy Maltby, Head of local energy, Regen
pmaltby@regen.co.uk

About Regen:

Regen is an independent centre of energy expertise with a mission to accelerate the transition to a zero-carbon energy system. We have nearly 20 years' experience in transforming the energy system for net zero and delivering expert advice and market insight on the systemic challenges of decarbonising power, heat and transport.

We have over 150 members who share our mission, including clean energy developers, businesses, local authorities, community energy groups, academic institutions and research organisations across the energy sector.

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Section 1: **Introduction**

The Review of Electricity Market Arrangements (REMA), launched by the Department of Energy Security and Net Zero (DESNZ) in the summer of 2022, could potentially bring forward the most comprehensive set of reforms to wholesale electricity market arrangements in Great Britain (GB) in over a decade. A second consultation was launched in March 2024, with the deadline to respond on 7 May.

The current wholesale market arrangements have facilitated the development of almost 56 GW of renewable capacity.[1] However, to reach net zero by 2050, the UK has committed to the full decarbonisation of the electricity sector by 2035. This aspiration creates significant challenges for the electricity system as demand and generation become more variable and weather dependent. Achieving this will require the development of an electricity system that will look very different to today, including around 2.5 times more generation capacity by 2035 and over four times more by 2050.

Future market arrangements through REMA need to enable the scale of investment required to achieve this, but also manage the impacts on the electricity system of an evolving generation mix, which will be more decentralised and dynamic than the current mix.

They also need to provide the right signals for flexibility, so that the system can cope with the variability of intermittent renewable generation and maximise the value of this to the consumer. With that in mind, REMA's core objective is to reform electricity market arrangements so that that they *"facilitate the full decarbonisation of the electricity system by 2035, subject to security of supply, and are cost effective for consumers".*

Regen intends to develop a response on behalf of local authorities in the Net Zero Living programme because REMA has the potential to significantly impact local authorities' ability to deliver on local energy and place-based net zero ambitions and we want to ensure that local authority voices and experiences are reflected in the development of this important policy area. This note aims to support local authorities to understand the key issues in the existing market the reforms REMA is proposing, including which parts of the consultation will be of most interest to local areas.

[1] Taken from the government's Energy Trends: UK renewables publication, December 2023.

We welcome and encourage the 52 local authorities that are part of that programme to join the Regen's REMA workshop to learn more about the reform options and share views that can contribute to our response. The session will be held on 18 April, online, and is open to all local authorities who are part of the Net Zero Living Future Ready programme. **Registration link here**

1.1 What do we mean by electricity markets?

The electricity markets were created to develop a more diverse and decentralised system through stimulating competition, investment and encourage new participants. The markets form the backbone of the electricity system and can broadly be split into two main areas:

- **Retail markets.** These cover the relationship between energy suppliers and end users of electricity such as households and businesses, as well as the structures and policies which protect consumers, such as price caps. The energy suppliers are the organisations that most individuals will be familiar with and receive bills from.
- **Wholesale markets.** The wholesale energy markets cover the relationship between energy generators (e.g. fossil gas generators and wind farms) and energy suppliers, and the policies or mechanisms that provide signals to invest in low carbon generation and how to operate assets that generate or use electricity. This also includes how supply and demand of electricity is balanced across the UK 24/7.

REMA is specifically focused on wholesale market reform. UK government is also undertaking a separate process of retail reform (see below).

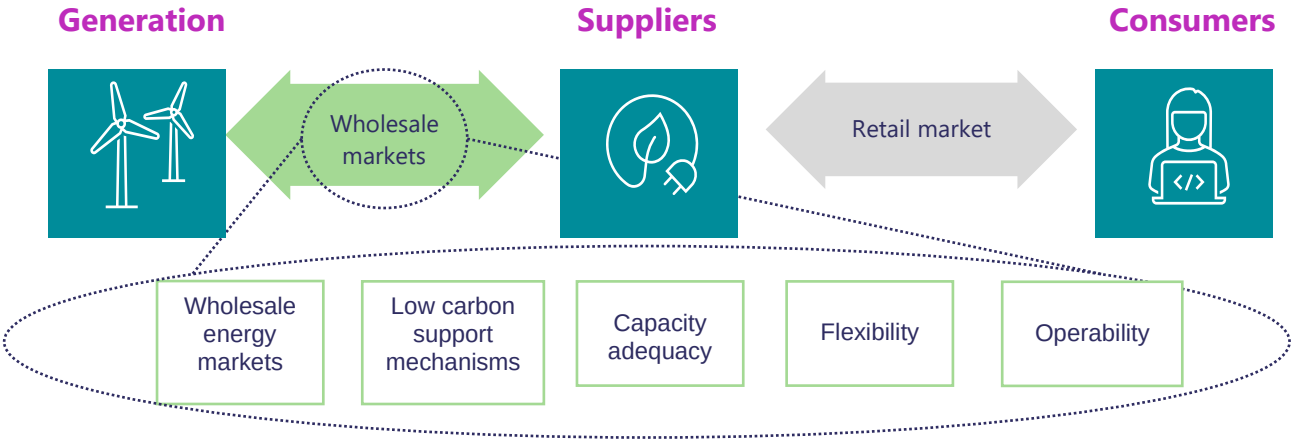

Figure 1: The scope of the REMA reform process

Future Retail Market Reform

Though separate in policy terms, the retail and wholesale markets often interact and are likely to do so more in local energy systems. The government has committed to explore retail reform in the publication of their vision for the energy retail market. This included releasing a Call for Evidence in 2023 on how the regulatory framework needs to evolve to support new ways of offering energy supply. More consultations are expected in 2024.

1.2 The first key part of REMA is the policies surrounding electricity prices and how they incentivise building more renewable energy

The wholesale price of electricity is determined by a careful balancing act. Renewable energy generators need a price that will encourage them to develop new capacity, but consumers need a price that is affordable.[2]

This issue is complicated further by the fact there isn't one clear price for electricity. Although we refer to 'wholesale electricity prices' this is often the price of the 'day ahead' trading of electricity. In reality, there are lots of different options for buying and selling electricity. Trading options can include forward trading for delivery at a future time – yearly, seasonally, monthly or day ahead. In fact, trading can continue right up to the point at which electricity is generated and delivered. Trading between generators and suppliers tends to start several years ahead. One route to 'lock in' prices for some demand or generation is through long term contracts called **Power Purchase Agreements (PPAs).**

Larger and existing generators may use a variety of trading options, whereas smaller schemes are likely to only have one PPA.

Because of this relative uncertainty in prices that generators will receive given the high cost of new generation, in 2013, the UK government created the **Contracts for Difference (CfD) scheme.** This was developed to provide a guaranteed price for new, large generators to enable them to create a business case for construction. A CfD essentially fixes the 'strike' price per MW at which renewable electricity is procured, providing generators with price stability to encourage investment. Hinkley Point C was supported by this scheme as are many offshore wind projects.

[2] The price which consumers pay in their bill includes wholesale prices as well as network costs and policy costs.

If the wholesale price is below this fixed price, the government [3] 'tops up' the price generators receive and pass this additional cost to suppliers and ultimately electricity consumers. If the wholesale price goes above this price, the generators pay back, ultimately to consumers. It effectively provides consumers with a 'hedge' against very high energy prices.

Figure 2: CfD support payments to generators. Source: REMA consultation

1.3 The second key facet of REMA is the rules and regulations for keeping the system balanced and operating effectively

The Capacity Market (CM) is an existing scheme with long-term contracts for generators designed to support security of supply and ensure that there is enough generation available on the system to keep the lights on in difficult or extreme events. The CM enables the government to buy capacity and provides generators with an additional source of revenue to remain operational.

On a day-to-day basis**, the Balancing Mechanism (BM)** is the ESO's most important tool to ensure that the total energy supplied in GB (generation, interconnection import, energy storage discharge) is equal to the total consumed at all times. In real time ESO does this by issuing instructions to participants to turn up or down generation or demand.

[3] Via an organisation called the Low Carbon Contracts Company

The BM is also used to manage constraints on the electricity network. A constraint occurs when the electricity system is unable to transmit power to the location of demand, due to congestion at one or more parts of the network. Relieving a constraint can be expensive as the ESO may have to both pay a wind farm to turn down behind a constraint and pay a dispatchable generator, such as a gas fired power station, to turn up in front of the constraint to balance the system. Currently there are no mechanisms in the market to reflect transmission constraints which can make it costly to keep the system operational.

One of the main options that REMA is consulting on is the introduction of **Locational wholesale pricing.** It proposes that electricity prices should be different across the country and used to incentivise (or disincentivise) particular locations for renewables, to avoid constraints and reduce the cost of balancing. This might mean some areas of the UK have a price that incentivises generation to locate near to demand or vica versa.

Locational pricing is a radical change and introducing it would be complex and take time. Supporters argue that stronger locational signals would incentivise both demand and supply to locate in places that is better for the system. However much of the industry is not in favour of such a move because of the complexity, risk and likely delays.

A very granular system of Locational Marginal Pricing (LMP) has been discounted as an option in an earlier stage of REMA but 'Zonal' pricing is now being explored. Although it could provide benefits,[4] Locational price differentials would be driven by network constraints, something largely determined by historic network investment. This could create winners and losers across GB based on whether they have historic energy infrastructure and investment.

For local areas this creates is a critical issue of fairness. All local areas should have the opportunity to develop low-carbon projects and contribute to the decarbonisation of our energy system, regardless of their location.

Figure 3 compares a zonal and a nodal market system. The government discounted the option for nodal LMP but has stated in this new consultation that it will continue to explore options for zonal LMP.

[4] You can read more about LMP here and here.

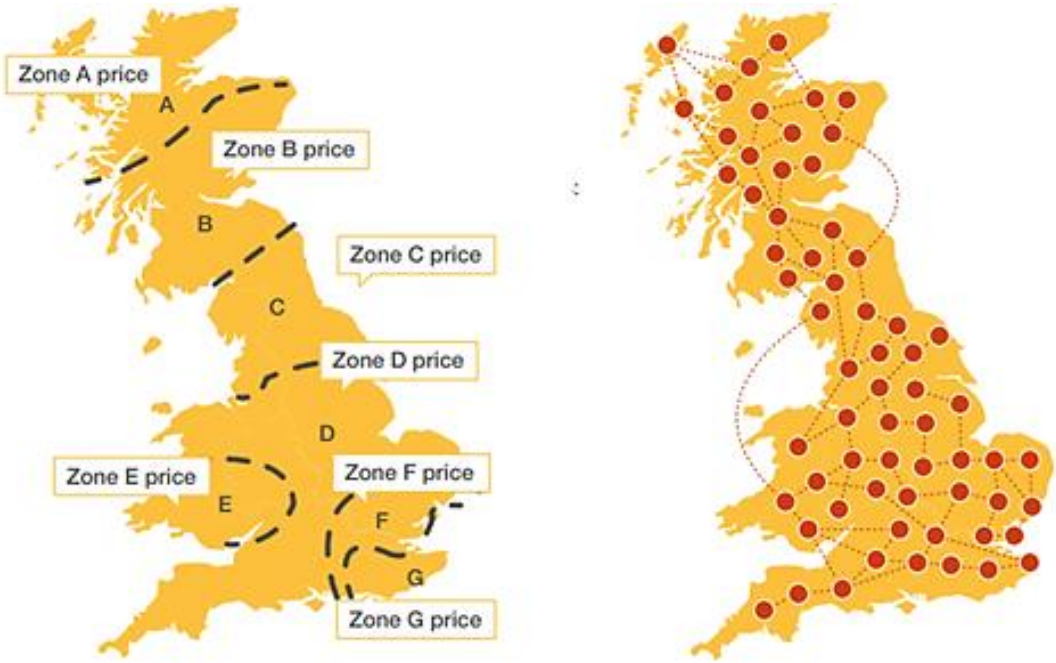

Figure 3: comparison of zonal and nodal LMP

1.3 What else has been going on?

Regional Energy Strategic Planners

There are several additional areas of energy system reform outside of the REMA consultation. This includes addressing the need for greater strategic – rather than market-based – planning of the whole electricity system – something that Ofgem is exploring with the new proposals to develop Regional Energy Strategic Planners (RESPs).

- The main purpose of RESPs will be to support the decentralisation and decarbonisation of generation and demand by:
- Ensuring there is appropriate accountability and effective coordination for strategic energy planning at a sub-national level.
- Ensuring that investment is made when and where it is needed and in a cost-effective manner.
- Coordinating regional energy planning in a way that is cross-vector, considers local priorities, and is coherent with national targets and pathways.

Key functions of RESPs will include:

- Cross-vector strategic planning (e.g. planning across energy, transport, heat, industry, etc)
- Technical coordination activities (e.g. energy demand modelling, whole system optioneering, conflict resolution)
- Place-based engagement and coordination,
- Providing support to local actors like local and regional authorities.

Section 2: **REMA and local areas**

The first Review of Electricity Market Arrangements (REMA), was launched by the government in the summer of 2022. This is the second official consultation (launched in March 2024) which has narrowed down options discussed in the first consultation. A number of the options that have now been dropped were significant for smaller scale and local energy for example smaller scale CfDs and local market options.

This second REMA consultation has been structured into four challenge areas and some potential solutions. The four areas between them cover a broad range of proposals and options for market reform and explore some of the deeper complexities within the current electricity market arrangement.

2.1 Overview of the four REMA challenge areas

- **Challenge 1: Passing the value of a renewables-based system to consumers:** considers the challenge of some generators having the opportunity to make excess profits, with the high cost of gas heavily influencing electricity prices. Reform options include an expansion of the CfD scheme, potentially to existing generators, and encouraging greater use of long-term price contracts such as PPAs.
- **Challenge 2: Investing to create a renewable-based system at pace:** focuses on ensuring that there are sufficient investment incentives to support the deployment of renewables and investment in grid, storage, flexibility etc. Options include reforming the CfD mechanism and the creation of new markets for flexibility, such as local constraint markets at scale.
- **Challenge 3: Transitioning away from unabated fossil fuels to a flexible, resilient and decarbonised electricity system:** explores providing support for new low-carbon generation like hydrogen and CCUS, long duration storage and flexibility. Reform options focus on changing to the CM to enable it to better support low-carbon flexibility.
- **Challenge 4: Operating and optimising a renewable-based system cost effectively:** explores the potential for more fundamental reforms to improve locational signals and ensure that markets support – and can provide services to enable – system operability and resilience. Reform options include a potential shift to zonal locational pricing for energy, moving to centralised dispatch or measures to improve the BM. [5]

[5] **Centralised dispatch**: the operation of power generators is centrally controlled, with the grid operator deciding which generators will be dispatched based on their cost, availability and other factors.

Not all of the REMA reform options, questions and solutions are relevant to local areas and some of the consultation questions are very technical and complex. A particular area of interest for local authorities will be where the reform options impact local ambitions to develop local energy markets and smart local energy systems – something that we outline in the below section and will explore in the REMA workshop on 18 April.

2.2 Local authority roles and REMA

Local authorities have several roles in the energy markets, however not many of these are reflected or referenced in the REMA consultation which is focused on national questions. At the moment, REMA does not offer significant support to local aspirations to build from the bottom up rather than the top down.

The energy market also views people as customers and consumers, rather than from a local authority lens as citizens and communities. As we rise to the net zero challenge, it will be increasingly important and potentially more effective to see people as citizens of local areas to be engaged in, and benefit from, a net zero transition rather than simply energy consumers who receive a bill.

Local authority roles in the energy system

- **Local authorities as market participants:** Local authorities are both large consumers of electricity and, increasingly, renewable energy developers, along with their local communities. It is important that the aspiration of these smaller locally owned generation with higher positive local impacts are also supported by REMA's changes. The consultation proposes to drop options such as small scale CfDs, although Regen believes there may be value in exploring this further. Similarly, the concept of a national green power pool has been dropped, but there are opportunities to think about how local renewable pooling arrangements could be integrated into the wholesale market. There are also remaining questions around the development of the PPA market which are a key part of the consultation.
- **Planning authorities:** Local authorities, in awarding planning permission, are a key decision maker on the location of energy demand, generation and network infrastructure in their localities. REMA's aspiration about locational and zonal charging looks through the lens of network capacity, but also needs to also be grounded in the realities and local politics of planning. Local authorities are well placed to help government understand how these issues should be addressed in wholesale market design.

- **Strategic place shapers setting local net zero ambitions:** Many local authorities have set high ambitions for their localities to deliver net zero including renewable energy targets or technology goals through local area energy plans and other place-based decarbonisation strategies. It is important that a market-based approach, where pricing is potentially linked to existing or historic energy network infrastructure, can support these new local ambitions and link effectively to the new role of the Regional Energy System Planners.
- **Developing local energy systems delivering net zero:** As well as individual projects in Net Zero Living, many local areas and communities are exploring options to localise the energy markets so they can benefit directly from and help shape the transition in their areas. This often involves developing complex and interlinked schemes that combine supply and demand with flexibility through batteries and demand-side response – naturally operating flexibly to maximise local benefits and deliver for communities. The second REMA consultation has dropped further explorations into Local Markets, but we would like to see further REMA proposals and policies that provide incentives and support the development of these 'bottom up' smart local energy systems.

2.3 Further reading

For those looking to take a deeper dive into previous work about the Review of Electricity Markets Arrangements:

- Community and local guide for Review of Electricity Markets Arrangement (March 2024)
- Regen initial thoughts on second REMA consultation announcement (March 2024)
- Locational Marginal Pricing paper (July 2023)
- Regen consultation response to initial REMA consultation (October 2022)

For more information about REMA please contact:

- Mollie Atherton, Regen
  matherton@regen.co.uk

- Poppy Maltby, Regen
  pmaltby@regen.co.uk